



Santee Cooper Second IRP Stakeholder Feedback

Dear Santee Cooper:

Stakeholders again appreciate the information provided and the opportunity for feedback. We note that the IRP process is approaching an “action” phase in which Santee Cooper will perform initial analysis and report results for review. Our recommendations would affect this analysis and we stand ready to work with you to discuss, clarify or otherwise help implement any of our recommendations prior to the next meeting. Particularly the recommendations and questions around expansion of the upcoming renewable energy procurement program, determining ELCC, and resource modeling appear to be time sensitive. Every utility is unique, but Santee Cooper also is negotiating a transition that similarly affects utilities in many parts of the country and that has caused some evolution in planning and analysis practices. Our technical experts have played a role in this transition, and we offer their assistance.

Overview of Key Topics

1. IRP Portfolio Selection
2. Fuel Price Forecasts & Assumptions
3. Solar & Storage Assumptions
4. Resource Adequacy & Solar Integration Studies
5. Transmission & Gas Networks
6. Demand Side Management
7. Just Transition

IRP Portfolio Selection

General Portfolio Questions

- We request that Santee Cooper provide the specific forced outage rates used for each generator in their system and detail what outage events/factors are incorporated into the forced outage rate, and which are not. Please provide details on how the rates are calculated, for example, what historical timeframe is considered? Are outage rates annual averages or monthly averages? Do they vary by winter or summer?
 - Also, as stated in the resource adequacy comments, we suggest that Santee Cooper incorporate an ELCC rating for thermal units which reflects their availability beyond typical UCAP definitions which rely on forced outage rates and ICAP only. Thermal generators should also be assessed in the ELCC framework based on their temperature-dependent derates, other weather-dependent or correlated derates/outages, and fuel supply disruptions to fully represent their contribution to reliability.¹
- Does Santee Cooper allow for self-owned or contracted hydro units to provide grid services beyond serving load or peak shaving? If yes, we ask that Santee Cooper explain how hydro units participate in either serving demand

¹ Astrape Consulting, *Accrediting Resource Adequacy Value to Thermal Generation*, March 2022, <https://www.astrape.com/aee-accrediting-resource-adequacy-value-to-thermal-generation/>



or ancillary services. If no, we ask that Santee Cooper explain why hydro units are unable to provide ancillary services to the grid.

- Our desire for learning more about this is because if existing hydro power units are available to provide ancillary services to the grid, costs associated with integrating renewable energy onto the grid may not be necessary or may be reduced.
- What types of energy storage resources will be considered for portfolio expansions?
 - Is there a limit to the duration considered by each portfolio (2,4,8,12-hour)?
 - We recommend that hybrid storage resources be 4-hours at a minimum as this allows them to dispatch for evening peaks after solar production wanes. If stand-alone storage were to primarily function as transmission infrastructure, we suggest caution in oversizing the unit's duration depending on how it will be dispatched to avoid overstating its cost.
- What considerations or analysis will be used for determining the optimal siting location of stand-alone energy storage resources?
 - For example, siting storage at the Winyah location can assist in reducing the need for additional transmission to be developed. The same consideration can apply to stand-alone storage sites nearby renewable energy developments (not necessarily co-located).
 - We suggest that stand-alone storage be reviewed as a transmission asset as well as an energy and capacity asset. Storage can play an important role in providing grid services such as voltage control and thermal overload protection.^{2,3} It is important for Santee Cooper to consider these benefits in their portfolios.
- We request that Santee Cooper provide the analysis used for the determination of combined cycle additions in any portfolio or sensitivity conducted by Santee Cooper for the 2023 IRP. Specifically, we request consideration and explanations be made available to stakeholders on how any of the following, or combinations of the following were considered against additional combined cycle capacity and why any proposed combined cycle additions were chosen.
 - EE/DSM measures
 - Renewable energy resources (including through competitive procurement)
 - PPAs
 - Joint dispatch agreements
 - Market Purchases from existing regional transmission organizations
 - Joining or creating a new regional transmission organization
 - Using best available technology for energy generation, transmission, storage and distribution
 - Arrangements with other electric utilities for interchange of power, pooling of plants or purchases of power (consideration of potential purchases via SEEM as well).

² WECC, *Storage As A Transmission Asset*, November 2020, <https://www.wecc.org/Administrative/Kopin%20-%20Storage%20as%20Transmission.pdf>

³ S. Thomas, *Storage As a Transmission Asset is Gaining Traction in Many RTOs/ISOs*, <https://energystorage.org/storage-as-a-transmission-alternative-is-gaining-traction-in-many-rtos-isos/>



Economically optimized resource plan (Portfolio #1)

During the stakeholder meeting, Santee Cooper indicated that some unit retirements would be hard coded. We request that Santee Cooper elaborate on specifically what assumptions (if any) would be hard coded into the economically optimized resource plan. Given this portfolio is meant to be economically optimal, we would urge Santee Cooper to consider a variety of retirement dates for generators and allow EnCompass to optimize around these scenarios. The concern we have with limiting hard-coded retirements is that the simulation output is input constrained from the start and it is unclear whether testing different hard-coded constraints could present a different portfolio that is just as or more economic than the constrained one. For example, the IRP should include a portfolio optimized around 2028 coal retirements where the total ELG costs at Cross and Winyah are avoided and storage, new capacity additions or transmission developments are presented as possible replacements.

Future Coal Retirements (Portfolio #2)

We seek additional explanation of the retirement assumptions that will be used in the future coal retirements scenario (portfolio #2) proposed by Santee Cooper during the April 29th stakeholder meeting. Santee Cooper indicated that portfolio #2 would include the “earliest practical retirement” of coal units. We ask that Santee Cooper provide more detail on what the earliest practical retirement date is for Cross Generating Station within this portfolio option (assuming that Winyah still retires by the end of 2028). Please also provide the rationale for how the earliest practical retirement date was determined.

In addition to more information on what future coal retirements look like for portfolio #2, we would like further information on what changes, if any, the potential rewriting of the EPA ELG guidelines will have on Santee Cooper's planned and future coal retirements. For example, it was suggested during the April 28th executive committee meeting that the ELG changes may result in the primary compliance pathway changing from the Generally Applicable to the Voluntary Incentive (VIP) or Low Utilization pathways. We are looking for information on how Santee Cooper is addressing and planning for these potential changes, whether in the base portfolio option or in a sensitivity. If the primary compliance pathway for Cross Generating Station changes to be the more expensive VIP option, will the increased compliance costs be viewed as an avoidable cost where alternative investments can be undertaken, and the plant can instead operate at Low Utilization or opt for early retirement?

Finally, we request that Santee Cooper provide more information on the financial impact of either Winyah or Cross (or both) opting for the VIP or Generally Applicable compliance pathways and the implication of spending significant amounts of capital (\$150-250 million for VIP) for coal plants that retire in the early to mid-2030s. We are concerned that if ELG costs are treated as sunk, then the early retirement of the coal plants would be overwhelmingly uneconomic since the initial costs would be unavoidable, when in reality a case where the plants are retired, and compliance funds are steered towards alternative investments may result in a more economically optimal outcome.

Potential Portfolio #4

During the IRP stakeholder meeting, Santee Cooper indicated that 3-4 portfolios would be considered for development in the IRP process. Three portfolios were outlined during the April stakeholder meeting, one economically



optimized one with hard-coded existing asset retirement plans, one early coal retirement plan and one net zero by 2050 plan. **We would like to propose a fourth scenario where Santee Cooper evaluates the economics and reliability of an environmentally constrained portfolio focused on coal retirements and clean energy replacements.** Specifics of this portfolio may include, but would not be limited to:

- Continued retirement of the Winyah coal plant at the end of 2028.
- We suggest retiring Cross Generating Station by 2028, or another near-term expedited date. This retirement date should be earlier than the Cross retirement in portfolio #2.
- A restriction on building any new fossil fuel plants over the study period.
- An accelerated solar and storage buildout mid-2020s and early 2030s.
- An expansion of transmission infrastructure and/or capacity sharing to enable greater amounts of interchange with Santee Cooper's neighbors.
- Additional regional coordination between DESC, Central and Santee on coordinated actions each can take to achieve greater regional reliability.
 - Including demand side management coordination with Central, increased market purchases from DESC, Consideration of increased purchases from Duke Energy Carolinas, Duke Energy Progress, Southern Company, and other entities that Santee Cooper regularly purchases power from.
- Include additional market purchases from 2029 afterwards for satisfying some capacity needs versus capacity expansion.
 - Slide 18 of the April 29th stakeholder meeting seemed to indicate that market purchases would decrease substantially after 2028. Can Santee Cooper please provide stakeholders with the reason market purchases must drop off significantly after 2028?

The main goal of this 4th portfolio would be to advance Santee Cooper and stakeholders' understanding of the costs and benefits of a portfolio that minimizes environmental risk and associated cost risks. This portfolio would expedite coal retirements and limit capital expenditures which may become stranded assets such as new gas units and additional gas pipelines. It would also quantify the fuel hedging benefits of long-term PPA contracts for renewable energy.

It is important that a study like this be conducted as soon as possible to allow for proper planning and development timelines to accommodate expedited coal plant retirements. We also want to emphasize that planning resource additions or transmission expansion for this portfolio should include efforts to optimize resource siting or storage deployment to mitigate or delay transmission upgrades that are solely for reliability and not necessarily providing economic access to regional capacity or benefiting resource adequacy.

Fuel Price Forecast Assumptions

Forecast starting points

Santee Cooper is proposing to use an average of the EIA 2022 Annual Energy Outlook (AEO) and S&P Global Platts fundamental forecast for fuel prices. Given the current volatility in natural gas prices and coal prices and the significant economic burden imposed on Santee Cooper as a result of the unforeseen spike in both of these commodity prices at the same time, we propose that Santee Cooper broaden its analysis of fuel price assumptions beyond the



three blended High, Medium and Low cases to try and capture a wider range of future prices when assessing the economics of proposed portfolios.

Proposed additional natural gas fuel price outlook

All three of the natural gas cases shown in the April 29th stakeholder meeting understate natural gas prices in the current market and predict substantial declines in prices by 2023. We suggest that Santee include additional natural gas price forecasts which begin with prices in 2022 at the current levels projected by the EIA in their May 2022 Short-term Energy Outlook (STEO).⁴ The EIA STEO predicts continued high natural gas prices for the remainder of 2022 with Henry Hub averaging \$8.59/MMBtu in the second half of the year. We propose two scenarios to be developed starting from the elevated 2022 EOY price of \$8.59/MMBtu and the average price for 2023 of \$4.74/MMBtu and using the Santee Cooper High and Medium gas price growth rates from this point forward to create two additional cases at a minimum.

These cases would provide Santee Cooper with additional insight into the economics of their portfolio and potential capacity additions in the case of sustained high natural gas prices over the long-term. Considering the rapid increase in monthly average Henry Hub natural gas spot prices from \$2.66 to \$6.60/MMBtu (April 2021 - April 2022), we suggest Santee Cooper adopt additional high gas price sensitivities to account for greater uncertainty in natural gas prices present in today's market so that planning can better account for this uncertainty.

Proposed coal price forecast changes

During the April 29th stakeholder meeting, Santee Cooper indicated they are interested in finding ways to increase the spread in their High, Medium and Low coal price forecasts. We agree with Santee Cooper's intent to better plan for the impact of unforeseen coal price fluctuations on their operational budget and ultimately, the ratepayers. Considering the recent impact on variable operating costs the simultaneous increase in natural gas and coal prices has caused, we suggest that Santee Cooper apply some high price level sensitivities to the coal price forecasts outlined in the April 29th stakeholder meeting. The EIA and S&P Platts average forecasts have a very tight spread between the low, medium and high cases. In absence of additional information that Santee Cooper can acquire, we suggest that adjusting initial coal prices to current 2022 prices and maintaining price growth projections from the S&P Global and EIA forecasts can provide additional insight into the cost Santee Cooper could face under a high coal price future.⁵

Firm NG Transport Reservation

We seek more information on how the fuel transport costs, such as the fixed NG transportation price, are accounted for in the cost of natural gas generation within Santee Cooper's modeling and planning. Is this applied as a fixed price adder to natural gas and considered in the variable operations and maintenance cost (VO&M) of generators?

⁴ Energy Information Administration, *Short-Term Energy Outlook*, May 2022, <https://www.eia.gov/outlooks/steo/>

⁵ Energy Information Administration, *Coal Markets - Average Weekly Coal Commodity Spot Prices*, May 2022, <https://www.eia.gov/coal/markets/#tabs-prices-2>



Solar & Storage Assumptions

Santee Cooper Energy Only Solar RFP & Hybrid Solar + Storage PPAs

Currently, Santee Cooper has plans for a 500 MW energy only solar procurement in 2023 required by statute, with a future procurement up to their target of 1500 MW by 2031. We suggest that Santee Cooper include hybrid solar + storage projects in these renewable energy procurement plans and in IRP capacity expansion plans. The benefits of hybrid solar plants include increasing the flexibility of solar resources by giving them a greater degree of dispatchability, and providing ancillary services, and reducing the need for transmission upgrades are well documented.^{6,7} By allowing for near-term procurement of hybrid solar resources, Santee Cooper can strategically plan to better accommodate the Winyah coal plant retirement with near-term renewable energy procurement and reduce the need for future capacity additions after the coal units retire while taking advantage of tax credits.

Storage Modeling Assumptions

The ITC limits grid charging of the storage asset to no more than 25% of energy for the first 5-years. After the first 5 years the resource is online the constraint should roll off and no longer apply. In addition, the constraint should be a soft limit which allows for some grid charging if it would save significant operating costs. A small amount of grid charging can improve reliability and operational flexibility. This is especially true to position battery systems for cold winter load ramps that drive resource adequacy and capacity needs. Allowing for modest grid charging is important because it does not overly constrain the flexibility of the storage asset to charge when prices are low and solar output is unavailable.

Sub-hourly Modeling and Storage Benefits

We suggest that Santee Cooper should consider either implementing sub-hourly modeling in its EnCompass production cost runs (in a similar fashion to the Astrape sub-hourly solar integration study) or through an out of model analysis where the additional value from standalone or hybrid storage resources can be realized. Typically, production cost modeling and capacity expansion models only reach hourly granularity in modeling, largely due to time and computational power constraints. While we recognize accommodating sub-hourly modeling may present challenges, we feel that some form of accounting for the full benefits of storage assets is required to select proper portfolios through the IRP process. Some of the benefits that storage can provide which may not be fully realized in an hourly production cost model are:

- **Operational flexibility** - battery energy storage can ramp at near-instantaneous speeds and can switch from full charge to full discharge in sub-second time frames.

⁶ U.S. DOE OE Energy Storage Peer Review, *Evaluation of Energy Storage as a Transmission Asset*, 2020, <https://www.osti.gov/servlets/purl/1821846>

⁷ ESIG, *Unlocking the Flexibility of Hybrid Resources*, March 2022, <https://www.esig.energy/wp-content/uploads/2022/03/ESIG-Hybrid-Resources-report-2022.pdf>



- **Grid Frequency Support** - Several categories exist, such as fast frequency response, primary frequency response, and regulation reserves and storage can participate in these services.
- **Automatic Generation Control** - inverter-based resources, like storage, are highly flexible and can follow AGC signals with a high degree of accuracy and fast response if directed.

As is discussed in the comments provided on the solar integration study, additions of standalone or hybrid storage resources can alleviate existing transmission and grid reliability issues presented by retirements of thermal generation or short-term variability in solar generation. These benefits should be accounted for when developing portfolios or embedded in the capacity expansion modeling, otherwise standalone and hybrid storage resources will not be fairly valued.

Technology Cost Assumptions

We agree with Santee Cooper's decision to incorporate capital cost assumptions for new resources using the NREL ATB and including the conservative, moderate and advanced cost curves as sensitivities for resources in the capacity expansion modeling. We also support the use of the Solar PPA modeling assumptions that are aligned with recent DESC and Duke proceedings.

However, more information is needed for the cost assumptions for resources using the EPRI TAGWeb and the Santee Cooper specific adjustments for South Carolina. In general, using generic industry values for some resources and custom values for others could bias results. We recommend Santee Cooper provide CCGT, SCGT Frame, and SCGT Aeroderivative capital cost and O&M cost assumptions for the stakeholders as soon as possible to ensure they are appropriate.

Resource Adequacy & Integration Studies

Astrapé Resource Adequacy Study

We appreciate the use of a third-party organization to develop the PRM and ELCC assumptions for the IRP. Resource adequacy and ELCC modeling practices are changing quickly with changes to the resource mix and utilizing a sequential Monte Carlo production cost tool like SERVIM is important.

We encourage Santee Cooper to incorporate recent analysis conducted by Astrape on cold weather impacts for thermal generation.⁸ Given that Santee Cooper's system is dual-peaking, and most resource adequacy risk occurs in the winter, understanding the capability of the thermal fleet during cold weather events is important.

⁸ Astrape Consulting, Accrediting Resource Adequacy Value to Thermal Generation, <https://blog.aee.net/with-fossil-fuel-plants-overvalued-its-time-to-get-capacity-right>



It is also important that if new solar and storage resources are considered with an ELCC, all proposed resources should be evaluated consistently. Thus ELCC for new thermal resources should also be considered taking into account weather dependent outages and fuel supply constraints.

We appreciate that the SERVIM analysis is modeling Santee Cooper's neighboring systems in the resource adequacy simulations. Interregional coordination is an important mitigation for resource adequacy risk and we recommend the following:

- Neighboring system capacity should not be artificially adjusted down to a specified 0.1 day/year LOLE target (by retiring generation or adding load), but rather employ the capacity mix considered in their respective IRPs,
- Interchange with neighbors during shortfall events should not be limited by an exogenous "market limit" assumption. Instead, interchanges should only be limited by the technical limits on the transmission system and resource availability from neighbors.
- We encourage the SERVIM analysis to calculate a PRM requirement for Santee Cooper by itself, as another PRM requirement for the entire model footprint to calculate potential reductions in PRM requirements due to pooling of resources and load diversity.
- It appears that these recommendations could be covered under the proposed sensitivity list, but more information is required.

The use of the "ELCC portfolio matrix" is important to capture the synergistic portfolio effects of solar and storage together. We recommend that an additional solar tranche (i.e. 1000 MW PV, 4000 MW BESS) be included to show the ELCC under a high variable renewable scenario.

- It is unclear from the matrix whether battery capacities are in MW or MWh,
- If the former, the battery capacity is significantly higher than the solar additions.

Astrapé Solar Integration Cost Study

Regardless of methodology employed, calculating solar integration charges and applying them to solar resources is discriminatory. All resources have benefits and limitations and this analysis singles out a single resource type and ignores other aspects of grid inflexibility. No generation resource is perfect. For example, steam coal generators are inflexible, have high minimum loads, slow ramp rates, and long startup and shutdown times. Natural gas generators have fuel supply constraints. Large generators create the potential for large contingencies and require spinning reserves to cover potential disruptions. However, conventional generators are not typically assessed integration charges despite their high minimum loads, long startup times, or inflexibility. Those points aside, there are other methodological questions/comments:

It is unclear why the SERVIM analysis used for the solar integration costs is done across such a large range of scenarios (41 weather years x 5 LFE points = 205 scenarios). The primary driver in integration challenges is the sub-hourly variability and the reserve requirement, which will not change significantly from weather year to weather year. We are unaware of other jurisdictions doing integration analysis across so many samples and would like Santee Cooper or Astrapé to provide a reference for this approach.



Astrape did not provide information on how the 5-minute solar dataset was derived, as this is not provided by the NREL NSRDB used in the LOLE and ELCC analysis. This is an important assumption for the flexibility analysis and integration charges. Overestimation of sub-hourly variability would overstate the integration costs.

Rather than adding reserves until the starting point flexibility violations are reached, statistical analysis should be employed on the sub-hourly resource variability.⁹ There is nothing to say that the current flexibility violations are too high or too low, or that

It is likely that solar PV additions in the near future will have at least some amount of storage included, which would mitigate much, if not all, short-term variability and this does not appear to be reflected in the proposed SERVVM analysis.

Lastly, all of the utilities evaluated in the SERVVM model are facing similar solar integration challenges. More solar plants spread across a larger geographic footprint will inherently reduce per unit variability, creating a smoothing effect. Balancing should also be considered across a wider footprint.

Linking Modeling Tools (EnCompass, SERVVM)

There was no discussion in the SERVVM slides or throughout the stakeholder session on the overall model flow of data and assumptions between tools. Presumably the SERVVM analysis will be conducted to create *inputs* into the EnCompass capacity expansion planning process. This however has limited benefits.

For example, it is imperative that the resulting portfolios from EnCompass get tested for resource adequacy back in the SERVVM model. This will 1) test the ELCC assumption on a specific portfolio of resources, ensuring that the interactive, synergistic effects considered in the input analysis is reflected accurately, 2) ensure the resulting portfolios are reliable, 3) ensure that the resulting portfolios are not overbuilt. The PRM and ELCC assumptions are estimates which will vary based on the actual resource mix selected by the EnCompass model.

In addition, if storage is selected by the EnCompass model, there may not be any need for integration charges or additional reserve requirements introduced by the additional solar PV.

It is important that the SERVVM analysis be conducted *after, or in parallel, to the EnCompass modeling work. While we recognize this increases effort in the IRP process, it ensures more robust portfolios and accurately reflects the system being considered, rather than the assumed system evaluated in the SERVVM input analysis.*

⁹ Ibanez, et al., *A Solar Reserve Methodology for Renewable Energy Integration Studies Based on Sub-Hourly Variability Analysis*, National Renewable Energy Laboratory, <https://www.nrel.gov/docs/fy12osti/56169.pdf>
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Transmission & Gas Networks

Interregional Coordination

The upcoming Santee Cooper and Dominion Energy South Carolina (DESC) retirements of the Winyah, Wateree and the possible near-term retirement of Williams coal plants (~2,691 MW in total) presents a unique opportunity for Santee Cooper to engage in greater levels of coordination with its immediate neighbors to in part satisfy its reliability and capacity needs. We suggest that Santee Cooper, in conjunction with Central Utilities and DESC, conduct a joint study on the ability for interregional coordination to alleviate planning challenges around impending coal retirements and benefit individual PRM studies by reducing the need for higher reserve margins.

Astrape Consulting is already conducting a PRM study for Santee Cooper which considers neighboring balancing authorities' potential contributions to Santee Cooper during reliability events based on their probabilistic analysis. We suggest additional studies could be proposed where retirements, capacity expansion and transmission development planning could be coordinated between the three entities and attain more efficient planning reserve margins, cost-effective portfolios and increased renewable energy and energy storage deployment while achieving the planned coal retirements and potentially allowing for additional coal retirements and avoiding significant ELG compliance costs.

Transmission Transparency

During the April 29th IRP stakeholder meeting, Santee Cooper was asked about using market purchases instead capacity additions to satisfy some of their planning needs after Winyah retires. In response, Santee Cooper indicated that they have limited high voltage transmission connections with neighboring systems which limits their ability to participate in increased interchanges with neighboring balancing authorities to meet their reserve margin needs.

We ask Santee Cooper to please characterize their existing transmission infrastructure that connects with neighboring regions. What type of lines and voltage levels are present, what are the limits on simultaneous imports? In addition, we ask that Santee Cooper indicate whether consideration of developing new or upgrading existing transmission lines to increase import capacities have been or are being considered and that Santee Cooper provide access to any transmission studies used to characterize their system for the purpose of the IRP or used as a basis for the IRP.

Regarding the benefits of transmission, it is widely documented by neighboring utilities (Duke subsidiaries, Southern Company subsidiaries, etc.) that more interconnected systems achieve lower planning reserve margins and therefore require less capacity expansion to maintain reliability standards such as 0.1 Loss of Load Events (LOLE) per year.^{10,11} Based on the Astrape Consulting presentation during the stakeholder meeting, we feel that the PRM study is likely to contain sensitivities on top of the interconnected system modeling Astrape has proposed. However, we want

¹⁰ Astrape Consulting, Duke Energy Progress 2020 Resource Adequacy Study, 2020
<https://dms.psc.sc.gov/Attachments/Matter/fbc46af8-82d2-4d44-856a-004f8e1bba65>

¹¹ GA Power, Georgia Power's 2022 Integrated Resource Plan, 2021
<https://psc.ga.gov/search/facts-docket/?docketId=44160>



emphasize the importance of providing a thorough set of transmission sensitivities for the PRM study as well as other planning studies (such as the IRP or coal retirement studies) and suggest that Santee Cooper encourage Astrape to pursue several sets of transmission expansion sensitivities to inform the PRM study and provide these results to stakeholders. Additional transmission investment undertaken by Santee Cooper could result in lower PRM requirements by increasing Santee's ability to interchange with neighbors, deferring capacity expansion. Furthermore, increased transmission investment will result in an improved ability to site and integrate more renewable resources to accommodate the commercial and residential desire for increased access to renewable energy.

FEED Study Transparency

At this time, Santee Cooper has developed only one resource portfolio (construction of a new natural-gas-fired combined cycle power plant at Winyah). IRP Stakeholder engagement is thus focused on fully understanding this portfolio and on developing potential alternative resource portfolios.

Based on public presentations by Santee Cooper, the availability of natural gas and the need for pipeline infrastructure upgrades and potentially electric transmission upgrades are a material issue for the feasibility and reliability of the proposed Winyah NGCC portfolio. For instance, Santee Cooper's 2020 IRP stated that

... Santee Cooper has identified natural gas supply as a significant resource planning consideration that could affect its decision to develop one potential generation site over another. While the assumptions presented in the IRP Report reflect current reasonable assumptions for the cost of natural gas supply, Santee Cooper is still investigating fuel supply and other considerations that could ultimately affect resource and site selections. IRP at 64.

Subsequent to the 2020 IRP, Santee Cooper performed further analysis, and has designated NGCC at the Winyah as the "preferred site." Santee Cooper has asserted to Stakeholders that "getting gas to Winyah is feasible." Stakeholder Presentation #1 at Slide 42.

Part of the further analysis of the feasibility and cost of getting gas to Winyah is a recently-completed Front-End Engineering and Design ("FEED") Study. A Santee Cooper representative indicated during the Stakeholder meeting that Santee Cooper paid for the FEED Study and it has reportedly been provided to Central Electric Power Cooperatives, Inc. ("CEPCI"). Timely provision of this study to CEPCI was considered an important step to allow CEPCI to determine whether or not to share the cost of the proposed Winyah NGCC, and at this time, CEPCI has declined to participate in those costs.

Stakeholders request the FEED Study. At the Second Stakeholder Meeting, Santee Cooper appeared to decline to share the FEED Study, indicating that it is not a Santee Cooper study. Stakeholders note that the Study was procured by Santee Cooper for the purpose of determining the feasibility of Santee Cooper's current and only plan to provide power to its customers. The claim that it is not a Santee Cooper study and that it must be held entirely confidential brings into question the transparency of Santee Cooper's process and the viability of its only resource plan. Even if parts of the study are commercially sensitive, it is not credible to claim that the whole study may properly be held secret by a state agency that is, in addition, presumably recovering its portion of the cost of the study from its ratepayers.

When Santee Cooper files its IRP at the Public Service Commission it will be subject to legal discovery regarding the development and evidentiary support for its IRP, thereby allowing expert review of the Study at that time. Stakeholders suggest that, given the time sensitivity and the benefits of transparency and public review, providing the



Study within the Stakeholder process is a more constructive way to demonstrate the reasonableness and feasibility of the Winyah NGCC portfolio.

Demand Side Management

COMMENTS REGARDING DSM OUTSIDE OF SANTEE COOPER'S RETAIL TERRITORY:

The majority of Santee Cooper's load is outside of its retail territory. Stakeholders recommend that Santee Cooper explore the opportunity to partner with its customers to serve its load through cost-effective DSM.

1. Help My House as a Model for Santee Cooper Investment

The Electric Cooperative "Help My House" pilot program was formally evaluated in 2013¹² and is offered by some retail cooperatives today. Under the Help My House pilot, individual residential customers bore the full cost of home efficiency upgrades, which averaged \$7,500 at selected, highly-inefficient homes. The average program participant saved 11,000 kWh per year.¹³ The average participant also reduced kW coincident peak demand by 27% in June and by 46% in January.

While Help My House pilot customers fully funded their home upgrades, the evaluation report roughly estimated that if a cooperative were to provide \$500 per home in assistance (as an example) to help more customers take advantage of the program, the utility would effectively be buying energy at 1 cent per kwh over a ten year period.¹⁴ The utility would thus spend a small amount of its own funds to leverage investment by end-use customers, who would fund most of the efficiency improvement. Stakeholders suggest that Santee Cooper consider providing some amount of match to end-use customers across its full footprint in order to leverage this type of customer and system benefit.

The report further suggested that if the program were expanded beyond a pilot scale, it could be operated to achieve full cost recovery.¹⁵ The evaluation report also noted that the long-term impact of an expanded program on the electric cooperative revenue needed to recover fixed costs would be slight.¹⁶

Stakeholders understand that Santee Cooper oversees some funds from the VC Summer settlement that might be dedicated towards this or other EE efforts. Stakeholders also suggest that federal Green Bank or other funds might be leveraged.

Stakeholders also note that centrally administering a program through Santee Cooper or Central, or creating a separate non-profit entity dedicated to administering home efficiency throughout the Santee Cooper footprint, would likely be more administratively efficient than relying on each retail cooperative or muni to develop or adopt its own program. Further, it would allow HVAC contractors, training programs, and suppliers to interact with a single set of rules across multiple counties and territories rather than potentially multiple variations and offices. A larger-scale program

¹² https://www.eesi.org/files/HelpMyHouseFinalSummaryReport_June2013.pdf

¹³ *Id.* at 3.

¹⁴ *Id.* at ix.

¹⁵ *Id.*

¹⁶ *Id.*



with uniform rules also might enable customer benefits such as improved and standardized installation services and volume discounts or improved stocking practices for efficient HVAC equipment.

Stakeholders understand that an expanded program would likely produce outcomes that are different from the pilot. An expanded program likely would be less targeted to the most inefficient homes but also could enjoy economies of scale or be modified to reduce per-home costs or optimize cost effectiveness. An expanded program also could extend to small businesses with similar HVAC/building envelope needs.

Further, during the 9 years subsequent to the pilot program evaluation, heating and cooling technologies have changed and potential additional program elements such as smart thermostats, improved heat pump hot water heaters, electric vehicle charging, and lower-cost solar energy have become available. While some of these technologies do not save energy, they generally offer the opportunity to shape customer demand in order to increase load factor.

Stakeholders suggest that Santee Cooper evaluate a centrally-coordinated EE program across its full footprint that would blend a substantial rebate with customer-funded on-bill financing, targeting an average of at least 5,000 homes per year for a ten year period. At approximately 2 kW peak load reduction per home, this 50,000 home effort would eventually reduce coincident peak demand by 100MW, provide cheap “energy,” hedge against fuel cost risk, create local economic development, and develop a useful working relationship between SC utilities and their customers.

Despite the difference between a pilot program and a potential expanded program, Stakeholders believe that the pilot program report, provides a strong indication that it could be both cost effective and in the public interest for Santee Cooper to become a partner with its customers in obtaining low-cost, firm “negawatts” from residential customers in cooperative and muni territories that comprise part of Santee Cooper’s load.

2. Expanding Santee Cooper’s Own Efficiency Programs:

Santee Cooper has found its existing energy efficiency programs to be cost effective, based upon an accounting of its benefits to the utility system and reduced retail revenue. Because retail rates are usually higher than wholesale rates, this fact implies that Santee Cooper’s energy efficiency programs should be cost effective for Santee Cooper if they are offered to any similar end-use customer served through Santee Cooper’s generation.

Stakeholders thus ask whether Santee Cooper’s existing or planned energy efficiency programs would be cost effective for Santee Cooper if offered to similar customers throughout the broader Santee Cooper service footprint.

A. COMMENTS REGARDING DSM WITHIN SANTEE COOPER’S RETAIL TERRITORY:

Stakeholders look forward to reviewing the inputs, assumptions, and conclusions of Santee Cooper’s DSM Market Potential study and request that it be provided with any supporting appendixes and workpapers.

In preparation for a discussion of the market potential study stakeholders ask:

- How is maximum achievable potential derived from economic potential?
- How are measures and programs screened for cost effectiveness?
 - Are measures screened individually or in programmatic bundles?



- What program administrative costs and customer acquisition costs are included?
- What discount rate is used in cost-effectiveness screening?
- For TRC cost effectiveness, does screening acknowledge participant cost savings associated with reductions in O&M, equipment replacement, and reduced usage of other fuels?
- Will Santee Cooper provide programs to ensure access to energy efficiency services for low-income customers and industrial customers?
- Has Santee Cooper considered providing on-bill financing/collection mechanisms to increase adoption of residential building envelope improvements?

Just Transition

With the expected retirement of the Winyah Generating Station in 2028, it is essential that workers and the community are supported during the transition. We're happy that Santee Cooper has begun a separate process to engage with the community to develop and implement this transition plan. The stakeholders believe that there are opportunities in the integrated resource planning process that would aid this economic transition effort. Including both expected tax base contributions and community risk and impacts as factors in the resource selection process would yield the best result for the communities most impacted by the transition and can be balanced with other factors in the resource selection process.

To provide economic support to the County of Georgetown and other counties impacted by the coal plant closure Santee Cooper should include expected tax base contributions from different resource options and ownership models in the resource selection process. For full transparency, this information should also be shared with county leaders, community members, and other stakeholders in the Winyah transition planning process. Since Santee Cooper is tax exempt and not required to contribute to the local tax base for its generation resources, it would greatly benefit the counties where new generation resources are sited if the utility would contract for these services from an independent power provider (IPP) rather than self-build. By contracting for new resources and prioritizing the siting of these resources in counties impacted by the Winyah closure, Santee Cooper could help provide revenue for these communities during this economic transition. Since Santee Cooper also has an economic development mission, we believe this makes the utility well-suited to take a holistic view of resource planning that accounts for the economic impact of these decisions.

Assessing community impacts and risks of different resource options is another way Santee Cooper could address the Winyah Transition in its resource selection process. Consideration of the air pollution and health impacts of coal generation on local communities and the impact of any decisions to prolong coal unit operations should be taken into account. Health impacts are not exclusive to coal though as natural gas-fired resources can also have detrimental impacts on local air quality and public health. Fine particulate matter emissions (PM_{2.5}) from gas-fired resources have emerged as a major public health concern in recent research¹⁷. These public health impacts and the associated

¹⁷ <https://www.hsph.harvard.edu/news/hsph-in-the-news/natural-gas-biomass-surpassing-coal-as-biggest-pollutants-study-finds/>
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healthcare costs should be factored into resource decisions, especially in areas that have historically experienced air quality impacts from resources like coal-fired power plants. In addition to air quality concerns, explosions at power plants and issues with pipeline infrastructure should also be factored into resource decisions. These impacts could also result in liability issues for Santee Cooper and possibly the state and should be given consideration on these grounds as well.

Conclusion:

We appreciate Santee Cooper's invitation to comment and its commitment to a transparent and constructive process. Again, we stand ready to discuss, clarify, or help implement, and appreciate your time and effort.

Sincerely,

Concerned Stakeholders from the Santee Cooper IRP Process

- Alder Energy Systems, LLC
- The Coastal Conservation League
- Conservation Voters of South Carolina
- Sierra Club
- Southern Alliance for Clean Energy